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The impact of increased physical exertion on the state of adrenal cortex and pubertal development in boys

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Abstract

© 2014, Pleiades Publishing, Inc. The study of the functional state of the adrenal cortex (AC) in young athletes aged 11 to 15 years, which was assessed by daily free (Cf) and bound (Cb) cortisol excretion levels, and the comparison of these levels with those of the boys from the control group made it possible to conclude that the increased physical exertion in the form of regular athletic training had a dominating effect on the age-related changes in the AC and pubertal development in the young athletes. It was found that the 12- to 14-year-old athletes had stably high Cf excretion levels, which were significantly decreased by the age of 15 years on the background of high Cb levels, as compared to the nonathletes, whose urinary cortisol levels were significantly lower ($p < 0.05$) and were progressively increased ($p < 0.05$) from 13 to 15 years of age. It was found that pubertal development (the development of secondary sex characteristics) was relatively delayed in the athletes, and pubertal changes in the glucocorticoid function of the AC reflected mainly its adaptive responses providing the increased resistance of the child's body to increased physical exertion.

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Keywords

11- to 15-year-old boys, adrenal cortex, physical exertion, puberty